



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/827,520

04/20/2004

Charles Bryan Byrd

1002-028

2759

61275

7590

01/02/2008

HANSEN HUANG TECHNOLOGY LAW GROUP, LLP

1725 EYE STREET, NW

SUITE 300

WASHINGTON, DC 20006

EXAMINER

KISH, JAMES M

ART UNIT

PAPER NUMBER

3737

MAIL DATE

DELIVERY MODE

01/02/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/827,520	Applicant(s) BYRD ET AL.	
	Examiner James Kish	Art Unit 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____                                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> .                                  | 6) <input type="checkbox"/> Other: ____                           |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date  
:2/15/05,3/31/06,9/23/07,10/30/07.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 20 recites the limitation "the catheter-based ultrasound probe" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claims 12 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are:

Claims 12 and 23 provide for adjusting the transmitting frequency when the first image resolution is better than the resolution of the second image. However, there is no complementary step for when the second image's resolution is better than the resolution of the first image.

Note: Claim 24 provides this complement but should be fully incorporated into claim 23 to complete claim 23.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-5, 14, 17-18 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Lang et al. (US Patent No. 6,358,208). Lang discloses methods and devices for monitoring cardiovascular performance including probes for the methods. In some instances it will be desirable to provide a tunable micro-transducer that can transmit multiple frequencies. The micro-transducer can then either be adjusted by the operator to use the best frequency for the interrogation depth selected or the micro-transducer or the ultrasound system to which it is electrically coupled can automatically adjust the micro-transducer to the best frequency. Preferred frequencies include about 1, 3 and 5 MHz (column 55, lines 46-64).

Claims 1-7, 14-20 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Fife et al. (US Patent No. 4,534,221). Fife discloses an ultrasonic diagnostic imaging system wherein as the depth of focus is varied between near and far field focusing under operator control, the nominal frequency of the transmitted ultrasound energy is varied correspondingly by the system (see Abstract and column 1, lines 61-68). Also see column 6, lines 47-68 and Table I of column 7. Table I shows that there is an incremental change depending on the change of depth. Depending on

the change of depth between images, this increment can be 0.5 MHz or 0.1 MHz. Also as illustrated by Table I, a scan must have been performed by the operator to obtain the values in the table at some point prior to writing Table I.

Claims 1, 5, 9-11, 14, 18, 22 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Wilson et al. (US Patent No. 4,442,713). Wilson discloses an ultrasonic imaging apparatus having an array of transducer elements for transmitting ultrasonic signals into an object to be analyzed through use of the transmitted signals reflected from the object and sensed by the apparatus (see Abstract). A means is connected select a number of transducers in the array for transmitting the ultrasonic signals based on the second center frequency (column 2, lines 35-39). The second center frequency is frequency of the reflected signal after being attenuated by the tissue (column 2, lines 29-34). Also, an assumed second center frequency as a function of depth of focus can be used to select the number of transmitting transducers (column 2, lines 51-55). Note that the final center frequency used depends [in part] on the frequency-dependent tissue attenuation (column 2, lines 60-62).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lang in view of Yukov (US Patent No. 5,361,767). Lang discloses methods and devices for monitoring cardiovascular performance including probes for the methods. In some instances it will be desirable to provide a tunable micro-transducer that can transmit multiple frequencies. The micro-transducer can then either be adjusted by the operator to use the best frequency for the interrogation depth selected or the micro-transducer or the ultrasound system to which it is electrically coupled can automatically adjust the micro-transducer to the best frequency. Preferred frequencies include about 1, 3 and 5 MHz (column 55, lines 46-64). However, there is no thorough description as to how the interrogation depth is determined. Yukov teaches a B-mode imaging system that provides the operator with a control panel of image processing options. The control panel unit may include any suitable means known in the art for allowing an operator to select regions of interest On the image. For example, the control panel may include means for positioning digital calipers against the image to measure the size, depth and/or thickness (column 6, lines 14-30). Furthermore, the apparatus comprises a system for manually and/or automatically analyzing tissue matter to ascertain the nature of the tissue and/or its state (column 5, lines 65-68). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to allow an operator to select a region of interest on an image, determine the depth and provide the best frequency based on the depth, as disclosed by the combination of Land and Yukov.

Claims 12-13 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lang alone. Lang discloses methods and devices for monitoring cardiovascular performance including probes for the methods. In some instances it will be desirable to provide a tunable micro-transducer that can transmit multiple frequencies. The micro-transducer can then either be adjusted by the operator to use the best frequency for the interrogation depth selected or the micro-transducer or the ultrasound system to which it is electrically coupled can automatically adjust the micro-transducer to the best frequency. Preferred frequencies include about 1, 3 and 5 MHz (column 55, lines 46-64). Claims 12 and 23-25 are essentially claiming a "guess and check" scenario based on image resolution. The independent claims require the initial determined frequency to be automatically determined. These subsequent claims do not require any automation and therefore read on an operator performing (as it is known in elementary algebra) "guess and check," in general problem solving it is known as "trial and error," or "generate and test" in computer science. This is a known technique to those of ordinary skill in the art and is an obvious solution to a number of problems.

Regarding claim 13, the limitation "nearly the same point" is indefinite and the Examiner is interpreting this broadly to mean any two points in the cardiac cycle as being nearly the same.

### ***Conclusion***



Application/Control Number:  
10/827,520  
Art Unit: 3737

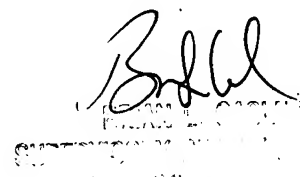
Page 7

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Kish whose telephone number is 571-272-5554. The examiner can normally be reached on 8:30 - 5:00 ~ Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMK

A handwritten signature in black ink, appearing to read "Bill", is written over a faint, rectangular stamp. The stamp contains some illegible text, possibly a date or official designation.